[0095] CLAIMS

WE CLAIM:

1. A peptide having an amino acid sequence selected from the group consisting of:

RVIRVVQRACRAIRHIVRRIRQGLRRIL (SEQ ID NO: 1);

RVIRVVQRACRAIRHIVRRIRQGLRRILRVV (SEQ ID NO: 2);

RWIRVVQRWCRAIRHIWRRIRQGLRRWLRVV (SEQ ID NO: 3);

RVVRVVRRVVRR (SEQ ID NO:4)

RRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 5);

VRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 6);

RRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:7);

RVVRVVRRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:8); RVVRVVRRWVRR (SEQ ID NO:9); RRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:10); VRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:11); and RVVRVVRRWVRRVRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWRVV (SEQ ID NO:12).

2. The peptide of claim 1 having the amino acid sequence:

RVIRVVQRACRAIRHIVRRIRQGLRRIL (SEQ ID NO: 1).

3. A composition comprising the peptide of claim 2 and a carrier.

4. The peptide of claim 1 having the amino acid sequence:

RVIRVVQRACRAIRHIVRRIRQGLRRILRVV (SEQ ID NO: 2).

5. A composition comprising the peptide of claim 4 and a carrier.

6. The peptide of claim 1having the amino acid sequence:

RWIRVVQRWCRAIRHIWRRIRQGLRRWLRVV (SEQ ID NO: 3).

7. A composition comprising the peptide of claim 6 and a carrier.

8. The peptide of claim 1 having the amino acid sequence:

RVVRVVRRVVRR (SEQ ID NO:4)

9. A composition comprising the peptide of claim 8 and a carrier.

10. The peptide of claim 1 having the amino acid sequence:

RRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 5).

11. A composition comprising the peptide of claim 10 and a carrier.

12. The peptide of claim 1 having the amino acid sequence:

VRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 6).

13. A composition comprising the peptide of claim 12 and a carrier.

14. The peptide of claim 1 having the amino acid sequence:

RRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:7);

15. A composition comprising the peptide of claim 14 and a carrier.

16. The peptide of claim 1 having the amino acid sequence:

RVVRVVRRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:8).

17. A composition comprising the peptide of claim 16 and a carrier.

18. The peptide of claim 1 having the amino acid sequence:

RVVRVVRRWVRR (SEQ ID NO:9).

19. A composition comprising the peptide of claim 18 and a carrier.

20. The peptide of claim 1 having the amino acid sequence:

RRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:10).

21. A composition comprising the peptide of claim 20 and a carrier.

[redacted]

22. The peptide of claim 1 having the amino acid sequence:

VRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:11);

23. A composition comprising the peptide of claim 23 and a carrier.

24. The peptide of claim 1 having the amino acid sequence:

RVVRVVRRWVRRVRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWRVV (SEQ ID NO:12).

25. A composition comprising the peptide of claim 24 and a carrier.

26. The peptide of claim 1 wherein said peptide has antimicrobial activity.

27. The peptide of claim 1 wherein said peptide has antimicrobial activity in low salt.

28. The peptide of claim 1 wherein said peptide has antimicrobial activity in physiologic salt.

29. An LLP-1 peptide analog wherein said peptide is modified to optimize amphipathicity.

30. An LLP-1 peptide analog, said peptide comprising an arginine residue on said peptide's charged face, wherein said arginine residue is substituted with another amino acid residue and wherein said peptide analog comprises an amphipathic α-helical structure.

31. An LLP-1 peptide analog, said peptide comprising a tryptophan residue on said peptide's hydrophobic face, wherein said tryptophan residue is substituted with another amino acid residue and wherein said peptide analog comprises an amphipathic α-helical structure.

32. An LLP-1 peptide analog, said peptide comprising a valine residue on said peptide's hydrophobic face, wherein said valine residue is substituted with another amino acid residue and wherein said peptide analog comprises an amphipathic α-helical structure.

33. An LLP-1 peptide analog, said peptide comprising a tryptophan residue and a valine residue on said peptide's hydrophobic face, wherein said tryptophan residue and said valine

residue is substituted with another amino acid residue and wherein said peptide analog comprises an amphipathic α-helical structure.

34. An LLP-1 peptide analog, said peptide comprising additional residues to increase its length, wherein said peptide analog comprises an amphipathic α-helical structure.

35. A solid phase substrate comprising at least one peptide selected from the group consisting of:

RVIRVVQRACRAIRHIVRRIRQGLRRIL (SEQ ID NO: 1);

RVIRVVQRACRAIRHIVRRIRQGLRRILRVV (SEQ ID NO: 2);

RWIRVVQRWCRAIRHIWRRIRQGLRRWLRVV (SEQ ID NO: 3);

RVVRVVRRVVRR (SEQ ID NO:4;)

RRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 5);

VRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 6);

RRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:7);

RVVRVVRRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:8); RVVRVVRRWVRR (SEQ ID NO:9); RRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:10); VRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:11); and RVVRVVRRWVRRVRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWRVV (SEQ ID NO:12).

36. The solid phase substrate of claim 35 wherein said solid phase substrate is a prosthetic device.

37. The solid phase substrate of claim 35 wherein the prosthetic device is a prosthetic joint.

38. The peptide of claim 1, said peptide comprising at least one cysteine residue.

39. The peptide of claim 39 wherein said peptide is a disulfide linked dimeric peptide.

40. A peptide-cargo complex comprising a cargo and a peptide selected from the group consisting of:

RVIRVVQRACRAIRHIVRRIRQGLRRIL (SEQ ID NO: 1);

RVIRVVQRACRAIRHIVRRIRQGLRRILRVV (SEQ ID NO: 2);

RWIRVVQRWCRAIRHIWRRIRQGLRRWLRVV (SEQ ID NO: 3);

RVVRVVRRVVRR (SEQ ID NO:4);

RRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 5);

VRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 6);

RRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:7);

RVVRVVRRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:8); RVVRVVRRWVRR (SEQ ID NO:9); RRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:10); VRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:11); and RVVRVVRRWVRRVRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWRVV (SEQ ID NO:12).

41. The peptide-cargo complex of claim 40 wherein said peptide has antimicrobial activity and said cargo increases the antimicrobial activity of said peptide.

42. A method for inhibiting the growth of a microbe comprising administering to a mammalian cell a microbial growth inhibiting effective amount of at least one peptide selected from the group consisting of:

RVIRVVQRACRAIRHIVRRIRQGLRRIL (SEQ ID NO: 1);

RVIRVVQRACRAIRHIVRRIRQGLRRILRVV (SEQ ID NO: 2);

RWIRVVQRWCRAIRHIWRRIRQGLRRWLRVV (SEQ ID NO: 3);

RVVRVVRRVVRR (SEQ ID NO:4);

RRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 5);

VRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 6);

RRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:7);

RVVRVVRRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:8); RVVRVVRRWVRR (SEQ ID NO:9); RRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:10); VRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:11); and RVVRVVRRWVRRVRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWRVV (SEQ ID NO:12).

43. The method of claim 42 wherein the microbe is selected from the group consisting of bacteria, fungi and virus.

44. The method of claim 43 wherein the virus is an enveloped virus.

45. The method of claim 44 wherein the enveloped virus is selected from the group consisting of retrovirus, herpesvirus, poxvirus, hepadnavirus, baculovirus, orthomyxovirus, paramyxovirus, togavirus. rhabdovirus, bunyavirus and flavivirus.

46. The method of claim 45 wherein the retrovirus is the lentivirus HIV-1.

47. The method of claim 45 wherein the herpes virus is HSV.

48. The method of claims 45, 46 and 47 wherein the mammalian cell is a human cell.

49. The method of claim 48 wherein the mammalian cell is a peripheral blood monocyte.

50. The method of claim 42 wherein said peptide inhibits microbial growth in *in vitro* cell culture.

51. A method for suppressing HIV-1 infectivity comprising contacting a mammalian cell having HIV-1 with an HIV-1 infectivity suppressing effective amount of at least one peptide selected from the group consisting of:

RVIRVVQRACRAIRHIVRRIRQGLRRIL (SEQ ID NO: 1);

RVIRVVQRACRAIRHIVRRIRQGLRRILRVV (SEQ ID NO: 2);

RWIRVVQRWCRAIRHIWRRIRQGLRRWLRVV (SEQ ID NO: 3);

RVVRVVRRVVRR (SEQ ID NO:4);

RRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 5);

VRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 6);

RRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:7);

RVVRVVRRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:8); RVVRVVRRWVRR (SEQ ID NO:9); RRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:10); VRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:11); and RVVRVVRRWVRRVRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWRVV (SEQ ID NO:12).

52. The method of claim 51 wherein the mammalian cell is a human cell.

53. The method of claim 52 wherein the human cell is a peripheral blood monocyte.

54. A method of inhibiting growth of a microbe in a subject comprising contacting a cell of the subject with a microbial growth inhibiting effective amount of at least one peptide selected from the group consisting of:

RVIRVVQRACRAIRHIVRRIRQGLRRIL (SEQ ID NO: 1);

RVIRVVQRACRAIRHIVRRIRQGLRRILRVV (SEQ ID NO: 2);

RWIRVVQRWCRAIRHIWRRIRQGLRRWLRVV (SEQ ID NO: 3);

RVVRVVRRVVRR (SEQ ID NO:4);

RRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 5);

VRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 6);

RRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:7); RVVRVVRRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:8); RVVRVVRRWVRR (SEQ ID NO:9); RRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:10); VRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:11); and RVVRVVRRWVRRVRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWRVV (SEQ ID NO:12).

55. The method of claim 54 wherein said peptide is administered enterally or parenterally.

56. The method of claim 42, 51 or 54 wherein said peptide is attached to a solid phase substrate.

57. The method of claim 54 wherein the microbe is selected from the group consisting of bacteria, fungi and virus.

58. The method of claim 57 wherein the virus is selected from the group consisting of retrovirus, herpesvirus, poxvirus, hepadnavirus, baculovirus, orthomyxovirus, paramyxovirus, togavirus. rhabdovirus, bunyavirus and flavivirus.

59. The method of claim 58 wherein the retrovirus is the lentivirus HIV-1.

60. The method of claim 58 wherein the herpesvirus is HSV.

61. The method of claim 59 wherein the cell is a perhipheral blood monocyte.

62. The method of claim 42, 51 or 54 wherein said microbe is resistant to antibiotics.

63. A method for suppressing the infectivity of HIV-1 in a subject comprising contacting a cell of the subject with a HIV-1 infectivity suppressing effective amount of at least one peptide selected from the group consisting of:

RVIRVVQRACRAIRHIVRRIRQGLRRIL (SEQ ID NO: 1);

RVIRVVQRACRAIRHIVRRIRQGLRRILRVV (SEQ ID NO: 2);

RWIRVVQRWCRAIRHIWRRIRQGLRRWLRVV (SEQ ID NO: 3);

RVVRVVRRVVRR (SEQ ID NO:4);

RRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 5);

VRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO: 6);

RRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:7);

RVVRVVRRVVRRVRRVVRRVVRVVRRVVRRVRRVVRRVVRVVRRVVRR (SEQ ID NO:8); RVVRVVRRWVRR (SEQ ID NO:9); RRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:10); VRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWVRR (SEQ ID NO:11); and RVVRVVRRWVRRVRRVWRRVVRVVRRWVRRVRRVWRRVVRVVRRWRVV (SEQ ID NO:12).

64. The method of claim 63 wherein the subject is human.

65. The method of claim 64 wherein the cell is a peripheral blood monocyte.